

## ALTAR TOMB IN EXETER CATHEDRAL.

This very beautiful specimen of early English work (supposed to be the tomb of Bishop Mariashall, who died in 1206), is placed under one of the arches separating the north aisle and choir: it appears to be of more ancient date than that part of the cathedral in which it stands, said to have been begun by Bishop Quivil, between 1281 and 1291.

The tomb, constructed of Purbeck marble, is much decayed; it is surmounted by a quaint and stilly-carved effigy of the bishop, in a kind of trefoil headed niche; one hand holds a crozier, the other is raised in the act of blessing. The figure is very flat, as usual on monuments of the period.

Fig. 1 of the accompanying illustrations represents the north side of the tomb, and Fig. 2 the south side. Fig. 3 is a spandril ornament, between two quatre-foils, each containing sculpture in the west end, and Fig. 4 a section at A. A.

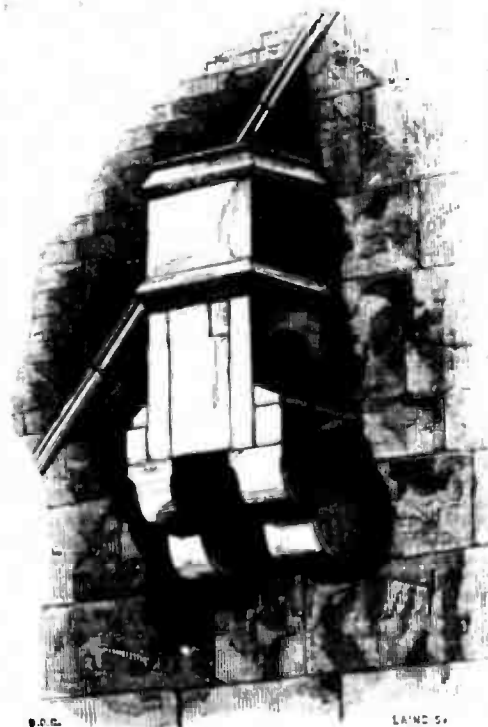
The present east end is a plain slab, but is probably not the original: Fig. 5, a compartment of foliage from the north side: Fig. 6, section at B, Fig. 7, section at C, Fig. 8, section at D.

The details are drawn one-fourth the actual size. E. S.

DRAINAGE OF GUILDFORD.  
ENGINEERING COMPETITIONS.

As the drainage of towns is becoming an important subject, perhaps an account of what is doing here may be interesting as well as instructive. The borough of Guildford comprises St. Mary's, Holy Trinity, parts of Stoke, Shalford, and St. Nicholas' parishes, that is the new borough,—the old borough, previously to its enlargement, consisted of the whole of St. Mary's, part of the Holy Trinity, and part of St. Nicholas' parishes. In 1812 an Act was obtained for paving, cleansing, improving, &c., which is now in existence, and its provisions are carried out by a board of paving commissioners, having power to raise certain sums for that purpose not exceeding in the whole 5,300*l*. Recently a committee of the commissioners has been appointed to inspect and obtain the removal of nuisances; and with a view to keep out of the operations of the Health of Towns' Bill, the committee advertised in THE BUILDER and in the Times, about the middle of December last, "That engineers be requested to furnish the best plan for draining the town of Guildford," as to surface drainage, and that also "engineers be requested to specify the best mode of disposing of the refuse contents of the sewage, whether into tanks," &c., &c.; for an effectual system of drainage for the town, and that "plans, specifications, and estimates be prepared by them in accordance," &c., &c.; the successful engineer to carry out the works, and obtain tenders within his own estimate, with the usual allowance of 5 per cent., and the committee not binding themselves to accept any one of the plans. Such an advertisement was calculated to bring forward men of ability and standing in the profession to compete; and on the 15th of January (the day appointed), nineteen plans, specifications, and estimates were sent in; but the committee had not the candour to allude at all to their limited Act of Parliament; they did not say to these gentlemen, that although we put forth that advertisement, we have no power beyond the old borough; neither did they say (which is the most important part) that they only had power to raise 5,300*l*., and that they were already in debt more than half that sum. Nineteen respectable engineers came forward, relying on the honour of the committee, and that they really meant what they said, that the competition would be fair, plans having to be sent in with a number or motto; and after great trouble, expense, and loss of time, have the mortification to find the committee have not the means to pay or power to raise a sum much over 2,000*l*.; they having required engineers to furnish estimates, &c., for works amounting at least to from 6,000*l*. to 15,000*l*. Surely these nineteen gentlemen have been ill-used, and might claim remuneration for what they have suffered in pocket and in time. Y. Z.

## CHIMNEY—ASLACKBY CHURCH, LINCOLNSHIRE.



## A CHURCH CHIMNEY.

In a late number there is a letter from Mr. Orford, about ecclesiastical chimneys: I enclose a sketch of one from Aslackby Church, Lincolnshire, which you may think interesting enough to publish. It is on the north side of the tower. The label seen in the sketch belongs to an arch now stopped up with a perpendicular facing; it is about 20 feet from the ground. The jointing of the chimney, though it has been complained of, is, I believe, correct.

Birmingham.

THOS. M. RICKMAN.

ON THE NATURE AND PROPERTIES OF  
THE METALS USED IN THE  
BUILDING TRADES.

## BRASS AND OTHER ALLOYS OF ZINC, &amp;c.

ALMOST all the metals combine with zinc, and some of its alloys are of great importance. The most ancient and universal of them all, however, is brass, which, strange to say, was made and known for centuries by those who knew not that zinc, one of its two sole constituents, had even an existence,—that is, as a metal; although, as already remarked, the Chinese and Hindoos were an enlightened exception.

Brass has been most usually and easily made from copper and calamine, the latter an ore of zinc in which the metal is corroded and invisible, hence the ancient popular ignorance just noted. Strata or layers alternately of plate copper and of a mixture of calamine and charcoal,—the latter to absorb the corroding oxygen of the former; or a mixture of granulated copper and the same ingredients, exposed till red heated, enables the metallic zinc to volatilise, or rise in vapour, and penetrate, or unite with, the copper, so as at once to form, according to the relative proportions of the materials, either some one of the varieties of brass, or other of its kindred alloys, such as pinchbeck, prince's metal, tombac. Or these varieties may readily be formed, or brass modified, by afterwards uniting the alloy, once got, with additional proportions either of copper or zinc. The metallic zinc, however, may also be at once united with copper by fusion, but the operation is critical.

The authorities whom we have consulted differ greatly as to the actual or best proportions of zinc and copper for making brass. English brass, according to Parkes, consists of one particle or atom of zinc and one of copper; Dutch brass of one-zinc, two-copper. In the "Encyclopædia Britannica," however (supplement to latest edition) two of zinc to one of copper are stated as the best proportions. The heavier brass is, the more copper it contains, the lighter, the more zinc, as might be expected, zinc being the lighter metal. The specific gravity of brass, however, is greater than that of its separate metals. In Knight's "Cyclopædia" the process of formation, and the proportions of calamine, &c., are stated as follows—The copper is poured into water, and converted into shot copper, the metal being thus granulated into pieces from the size of small shot to that of a bean. Of this 45*lb*., to 60*lbs*. of powdered calamine, and an equal quantity of charcoal, are put into earthen crucibles, and fire applied for seven or eight hours. By pouring the molten metal into shallow granite moulds, it is made to form plates of brass, which are afterwards rolled into thin sheets called latten. For bars, cast-iron moulds are also used.

Brass is more fusible than copper, and hence more easily cast. It is also much less liable to tarnish as well as considerably malleable and ductile, and may therefore be beat out into very thin leaves, and drawn into fine wire. The thin leaves called Dutch gold, or Dutch metal, are just brass beaten out into an imitation of gold-leaf. The "yellow metal," patented by Mr. Muntz, of Birmingham, and made into sheets thick enough for sheathing ships, in place of copper, is a composition of zinc (chiefly Belgian, we believe) and copper. Zinc itself, by the way, is now extensively used on the continent, and is even being introduced into this country, for a similar purpose.

Iron and zinc were, till lately, regarded as metals not easily united, on account of the volatility of the latter and the infusibility of the former. Dr. Graham, however, gave a different opinion: and, at all events, when plates of hot iron were dipped into a bath of melted zinc, it was found that an appearance of tin plate was acquired, and the iron thus prevented from rusting. This is the process